

REMARKS

In the Office Action of 5/2/2007, the Examiner rejected claims 2-8 and 10-16 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement, rejected claims 2-8 and 10-16 under 35 U.S.C. 112, second paragraph, rejected claims 2-3, 7, and 10-16 under 35 U.S.C. 102(b) as being anticipated by Hagelin et al. (US Patent 6,283,601, hereinafter Hagelin), rejected claims 2-3, 6-8 and 10-16 under 35 U.S.C. 102(e) as being anticipated by Aksyuk et al. (US Patent 6,366,414, hereinafter Aksyuk), rejected claims 4-6 and 8 under 35 U.S.C. 103(a) as being unpatentable over Hagelin in view of Miller et al. (US Patent 6,545,385, hereinafter Miller), and rejected claims 4-5 under 35 U.S.C. 103(a) as being unpatentable over Aksyuk in view of Miller. In this response, no claims have been canceled or added. Accordingly, claims 2-8 and 10-16 will be pending after entry of this Amendment.

I. Rejection Under 35 U.S.C. 112, First Paragraph

In the Office Action, the Examiner rejected claims 2-8 and 10-16 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Specifically, the Examiner indicated that claim 2 has been amended to recite "each torsional element is not substantially parallel to the substrate when the actuator body is elevated above the substrate in a motion substantially perpendicular to the substrate," and the disclosure fails to support this limitation nor is the scope readily apparent. Applicants respectfully traverse this rejection.

The amendments to independent claim 2 in the prior amendment are supported in the specification and figures and the scope of such are readily apparent. As described throughout the specification, a flexure may be attached to an actuator body via a torsional element that may be torsionally weak (i.e., flexible) to provide strain relief between the flexure and actuator body during elevation and to allow greater elevation of the actuator body (e.g., see Abstract and

paragraphs 0021, 0022, 0045, 0046, 0065, etc.). Paragraph 0066 of the specification further states:

FIG. 12 illustrates key features of the bimorph flexures that will aid in understanding the advantages of this invention. An isolated bimorph with one end anchored and the other end free is depicted. Note that the free end is not parallel to the substrate but rather at an angle. In contrast, FIG. 3 shows that both ends of the bimorph flexures 310 to be parallel to the substrate 320 in the complete actuator. Hence, there must be a moment on the end of the beam to force the angle from the free position. This moment can warp the platform and the mirror segment if the strain is not relieved. Furthermore, the moment acts against the elevation force of the flexures thereby reducing achievable height from the substrate. Finally, this is a spring hardening geometry, so the suspension is nonlinear and softens with higher actuation voltage thus invoking earlier snap-in during electrostatic actuation. All of these drawbacks may be circumvented by the present invention in the first embodiment. Namely, the torsionally weak attachment points or torsional springs 307 on the flexures allow the flexure ends to have an angle not parallel to the substrate. This strain relief reduced platform warpage, increases stroke height, and reduces spring softening during actuation.

[Emphasis added.]

As such, the specification discloses one embodiment, shown in FIG. 3, where the ends of the flexures are parallel to the substrate, and another embodiment, shown in FIG. 12, where the ends of the flexures are not parallel to the substrate. The flexure end comprises a torsional attachment that joins a corresponding flexure to the actuator body (e.g., see Abstract and paragraphs 0021, 0022, 0045, 0046, 0065, etc.). As such, Applicants submit that the amendments to independent claim 2 in the prior amendment are supported in the specification and figures and the scope of such are readily apparent. Applicants respectfully request reconsideration and withdrawal of the rejection.

II. Rejection Under 35 U.S.C. 112, Second Paragraph

In the Office Action, the Examiner rejected claims 2-8 and 10-16 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In particular, the Examiner stated that

claim 2 recites "not substantially parallel" and the scope of this limitation is not clear. Applicants have amended claim 2 to address the Examiner's rejection thereof.

III. Rejections Under 35 U.S.C. 102

In the Office Action, the Examiner rejected claims 2-3, 7, and 10-15 under 35 U.S.C. 102(b) as being anticipated by Hagelin and further rejected claims 2-3, 6-8 and 10-15 under 35 U.S.C. 102(e) as being anticipated by Aksyuk. Applicants submit that neither Hagelin nor Aksyuk, alone or in combination, disclose, teach, or even suggest each recited feature of claim 2. For example, neither Hagelin nor Aksyuk disclose, teach, or even suggest that each torsional element is not parallel to the substrate when the actuator body is elevated substantially perpendicular to the substrate.

Hagelin does not show in the figures nor discusses in the specification the position of the torsional element relative to the substrate when the actuator body is elevated above the substrate. As such, Hagelin does not teach or suggest that each torsional element is not substantially parallel to the substrate when the actuator body is elevated above the substrate in a motion substantially perpendicular to the substrate, as required in claim 2.

Figure 4 of Aksyuk shows an optical device 17 attached to beams 19, 21 being elevated over a substrate 13. However, Aksyuk does not teach or suggest that torsional elements connecting the beams with the optical device are not parallel to the substrate when the optical device 17 is elevated above the substrate in a motion substantially perpendicular to the substrate, as required in claim 2. In fact, Figure 4 of Aksyuk shows that the spring elements that couple the optical device 17 to the beams 19, 21 (shown as thin lines between the optical device 17 and the beams 19, 21) are parallel to the substrate when the optical device 17 is elevated.

For the above reasons, claim 2 is believed to be in allowable form. Claims 3, 6-8 and 10-16 are dependent upon claim 2 and are allowable for at least the same reasons as claim 2.

IV. Rejections Under 35 U.S.C. 103

In the Office Action, the Examiner rejected claims 4-6 and 8 under 35 U.S.C. 103(a) as being unpatentable over Hagelin in view of Miller and rejected claims 4-5 under 35 U.S.C. 103(a) as being unpatentable over Aksyuk in view of Miller. As discussed above, neither Hagelin nor Aksyuk, alone or in combination, disclose, teach, or even suggest each recited feature of claim 2. Miller does not cure the deficiencies of Hagelin and Aksyuk. Claims 4-6 and 8 are dependent upon claim 2 and allowable for at least the same reasons as claim 2.

CONCLUSION

Based on the foregoing remarks, Applicants believe that the rejections in the Office Action of 5/2/2007 are fully overcome and that the application is in condition for allowance. If the Examiner has any questions regarding the case, the Examiner is invited to contact Applicants' undersigned representative at the number given below.

Respectfully submitted,

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